of 10.2 feet against the end wall. A sample weighs 26 lbs. to the 1,000 cubic inches. How many centals are there in the heap?

5. A vessel in the form of frustum of a cone measures as follows :

> Bottom diameter.. 110 inches.
> Top   do   100   "
> Depth 100   "

what would be its capacity in cubic inches, if filled to within ten inches of the top, and how many proof gallons would this represent if the spirits contained therein were 30 under proof?

6. If the vessel mentioned in the next preceding question was horizontally divided into ten equal sections of ten inches each in depth, what would be the number of proof gallons contained in the third section from the bottom, the spirits being 50 over-proof?

7. A quantity of corn is thrown up in the corner of a granary as follows : At the base it extends 30 feet along either wall, and is confined by boards to the height of 4 feet, from which point it slopes evenly back to the top of the pile, which is levelled off at 148 inches from the floor. At the top it extends six feet along either wall. A sample weighs 26 lbs. to the 1,000 cubic inches. How many centals does the heap contain?

No. 8.

HYDROMETER AND SPECIFIC GRAVITIES.

Time—1 Hour.

(Maximum number of marks attainable, 100.)

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1. What are the weights per Imperial gallon of absolute alcohol, proof-spirit and water respectively?

2. Explain the principle upon which Syke's hydrometer is constructed?

3. Can the indications of the instrument referred to be affected by adding to the spirits under test any soluble matter having a greater specific gravity than water if so, name the articles?

4. If the spirits to be tested were by natural or artificial means reduced to an abnormally low temperature, would the spirits contract in volume? Would the strength by Syke's tables show a corresponding increase ; and would any|change take place in the weight of the volume?

5. Will the mixture of one gallon of water and one gallon of spirits at 50 over proof make two gallons, and what will be the strength of the mixture?